

NATURAL RAINFALL.

DOES NATURE SLIGHT LAND IF TREES
HAVE BEEN REMOVED?A Problem That the Son of Columbus
Started Out to Solve—Many Scientists of
Various Countries Have Given the Sub-
ject Much Study.

A son of Christopher Columbus once under-
took a task of discovery that proved
much more difficult than that which his
father had tackled so successfully. In a
comparatively short time Christopher had
the solution of his problem. The answer
which his son, Fernando, set out to find is
still missing. But the younger Columbus
thought he had discovered the true rela-
tions of forests to water supplies, and he
announced that the copious rainfall of Ja-
maica was produced by the island's wealth
of forests and that the decrease of rain in
the Azores and Canaries was because of the
removal of the wooded areas.

For as long perhaps as men have given
any thought to this matter it has been the
common supposition that forests increase
the rainfall within the area of their pos-
sessed influence, and in that way and other
ways augment the flow of brooks and riv-
ers. The earlier efforts to determine through
scientific methods whether there is any
good ground for the supposition were made
with appliances so crude that the margin
for error must have been considerably in
excess of the influence, if any, which the in-
vestigators hoped to measure. In later
years efforts in the same direction have
been made with great pains, mostly in Eu-
ropean countries, but the problem has been
found to have so many factors that, al-
though the mass of information collected
is extremely interesting, the main question
remains practically unanswered. The re-
sults of these efforts, together with some
interesting observations thereon, are set
forth in a bulletin of the forestry division
of the department of agriculture.

Water comes as near being indestructible
as any substance of which we know. Con-
sequently the total quantity of it in the
earth and in the earth's atmosphere is al-
ways the same. Only a very small per-
centage of it is what one of the writers in this
bulletin terms the circulating part of the
earth's water capital. The sun makes vapor
of water that is lying at its level or on
the way to find its level. This vapor is con-
densed until it is heavier than the air and
starts again toward its level, and that is
how the circulation goes on. In what way
does the presence of forests influence this
circulation?

It would be a long story to tell of the
methods employed in France, Germany,
Sweden, Austria and other countries of Eu-
rope to measure the various influences that
must be considered in determining how and
to what extent the rainfall and the flow of
streams are affected by the presence of for-
ests. A very important factor, since heat
is what starts the movement of the earth's
circulating water capital, is the matter of
temperature, and the results of the investi-
gations seem to show beyond dispute that
forests reduce the maxima and the minima
of temperature, that they reduce the maxi-
ma more than the minima, and that conse-
quently their effect is to make the average
temperature for the year cooler.

Also, their moderating influence is greater
than their cooling effect. Because the
air above forest regions is slightly cooler
than the strata over treeless tracts, con-
densation should be more rapid than over
open fields, and the rainfall should be
greater. These cooler bodies of air, being
blown over adjacent regions that are not
wooded, should also increase somewhat the
precipitation there. Thus to see theory,
it seems to be in some degree supported
by the measurements that have been made.

Accepting the conclusion that, in general,
forests increase slightly the fall of rain,
snow and dew, it remains to be determined
how much of this increase is available for
beneficial purposes. Part of it is inter-
cepted by foliage, and is returned to the
atmosphere by evaporation without having
reached the ground. The proportion so re-
turned varies with the nature of the foliage,
the density of the forest and the season of
the year. The retention by evergreen trees
is less than by deciduous. It is estimated
that perhaps 80 per cent of the precipitation
is thus intercepted and returned to the at-
mosphere. Of course this interception and
evaporation go on where the surface of
the earth is covered by grass and other
growing crops. Whether it is sufficiently
greater in the forest than in the field to do
away with the excess of precipitation on
wooded tracts over that on cleared areas is
an unsettled question.

Of the 70 per cent of rainfall which, it is
estimated, reaches the ground in forests, a
part is very quickly returned to the at-
mosphere by evaporation, but here the loss is
considerably less than in the open field.
Under certain conditions it is not more than
15 per cent of what it would be on bare soil,
but the conditions are so various that it is
difficult to arrive at an average. Again, out
of this 70 per cent of precipitation which
reaches the ground in wooded areas must
be deducted the loss by transpiration, "the
process by which the plant gets rid of the
surplus water after having drawn it from
the soil in order to extract from it the
nutriment which is present in only a very
highly attenuated solution." Various in-
genious methods have been resorted to for
determining the amount of moisture used
in this way, but because of the many fac-
tors having to do with it, the amount, for
the various kinds of vegetation can be in-
dicated only with a wide margin for vari-
ations.

While as it stands now nobody can say,
as a result of scientific investigation,
whether forests increase the fall of rain,
snow or dew to an appreciable extent, there
is no room for doubt that wooded areas are
valuable conservators of moisture. In this
way they make the flow of streams more
even, and they preserve the constancy of
springs. In wooded areas there is a loss by
interception and evaporation in the foliage
and by transpiration, and there is a consid-
erable gain in the protection from evapora-
tion from the surface of the ground. It is
not probable that this conservation of the
water supply comes anywhere near the
mark drawn by those who hold that the
preservation of woodland insures an abun-
dant supply of water, but the benefits re-
sulting from it are sufficient to be consid-
ered among the other excellent reasons for
looking well to the preservation of forests.
—New York Sun.

A Mysterious Canine Critic.

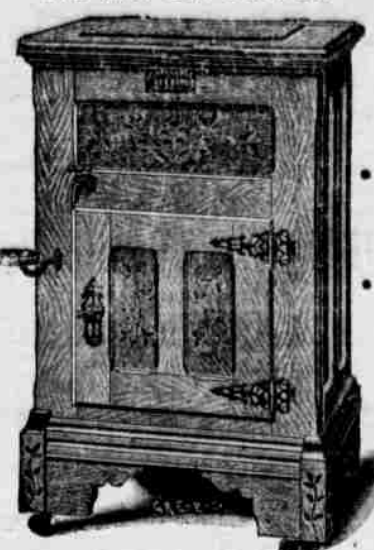
A wonderful story of a French musical
critic is related by persons who profess to
have been acquainted with him and to have
seen him in attendance on musical per-
formances. He was a dog, and his name
in public was Parade. Whether he had a
different name at home was never known.
At the beginning of the French revolution
he went every day to the military parade in
front of the Tuilleries palace. He marched
with the musicians, halted with them, lis-
tened knowingly to their performances,
and after the parade disappeared, to return
promptly at parade time the next day.
Gradually the musicians became attached to
this devoted listener. They named him
Parade, and one or another of them always
invited him to dinner. He accepted the in-
vitations and was a pleasant guest. It
was discovered that after dinner he always
attended the theater, where he seated him-
self calmly in a corner of the orchestra and
listened critically to the music.

If a new piece was played, he noticed it
instantly and paid the strictest attention.
If the piece had fine, melodious passages,
he showed his joy to the best of his doggy
ability, but if the piece was ordinary and
uninteresting he yawned, stared about the
theater and unmistakably expressed his
disapproval.—Youth's Companion.

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& Martin Blacking, galvanized
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